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PLANETARY PHENOMENA FOR MARCH AND
APRIL, 1912.

BY MALCOLM McNEILL.

PHASES OF THE MOON, PACIFIC TIME.

Full Moon ... Mar. 3, 2 ^h 42 ^m A.M.	Full Moon ... Apr. 1, 2 ^h 5 ^m P.M.
Last Quarter.. " 10, 11 55 A.M.	Last Quarter.. " 9, 7 24 A.M.
New Moon .. " 18, 2 9 P.M.	New Moon ... " 17, 3 40 A.M.
First Quarter.. " 25, 7 2 P.M.	First Quarter.. " 24, 12 47 A.M.
	Full Moon ... " 31, 2 19 A.M.

Two of the four eclipses of the year occur during April. The first is a partial eclipse of the Moon on April 1st. It will not be visible in the United States; the beginning will be visible in the eastern hemisphere and eastern South America and the end in Central Asia, Europe, Africa, and South America. The greatest obscuration will be less than one fifth of the Moon's diameter.

The second is a central eclipse of the Sun on April 14th, visible as a partial eclipse in portions of the United States east of the Mississippi just after sunrise. The line of central eclipse runs from Guiana in South America across the Atlantic into Spain, through Europe, and ends in Siberia. For nearly all of this path the eclipse is annular, but there is a small part of the path through Northern Spain where the eclipse is total. The duration of totality at any special point is very brief, a very few seconds, the apparent size of the Moon being almost exactly that of the Sun. If any photographs can be taken during this brief period, they will give a fine chance for study of the lower corona.

The Moon will occult the first-magnitude star *Antares* on the evening of April 5th, and the phenomenon will be visible generally throughout the United States. Times for the eastern part of the country will be shortly before midnight, local time, and earlier for the western part, not merely on account of difference of local times, but on account of the motion of the cylinder of the shadow. As an occultation is a special case of an eclipse, a solar eclipse being merely an occultation of the

Sun, the prediction of exact times for a special place is a matter involving rather laborious computation.

The vernal equinox, the time when the Sun crosses the equator from south to north occurs on March 20th about 3 P. M. Pacific time.

Mercury passes superior conjunction with the Sun on March 2d, reaches greatest east elongation on March 27th, and passes inferior conjunction on April 15th. It is therefore an evening star from March 2d to April 15th, and a morning star during the rest of the period. Usually the best conditions for visibility occur when *Mercury* is an evening star during the spring months, but its position in its orbit makes the condition for visibility not as favorable as is usual during spring east elongations. The planet passes its perihelion on March 19th, only eight days before greatest elongation. This makes the elongation smaller than the average, and the proximity of the planet to the Sun causes a more rapid motion of the former. So the elongation is not nearly as long in duration as is usual. However, *Mercury* will be far enough away from the Sun for naked-eye observations as evening star during the twilight for the latter half of March. During the last half of the month it remains above the horizon more than an hour and a half after sunset. On April 27th it is in close conjunction with *Venus*, but the planets are then too near the Sun for naked-eye view.

Venus remains a morning star throughout the period, rising on March 1st, a little less than an hour and one half before sunrise, and this interval diminishes to about forty minutes by the end of April, an interval almost too small for naked-eye view, as the planet will be almost at its faintest. This is mainly because *Venus* is well on its way to superior conjunction and therefore at nearly its maximum distance from the Earth. *Venus* will be occulted by the Moon on April 15th, but the phenomenon will not be visible in our hemisphere.

Mars remains visible in the evening sky throughout the two months' period, setting at 1:35 A. M. on March 1st and just before midnight on April 30th. During the month it moves about 35° eastward through *Gemini* into *Cancer*. Its distance from the Earth increases rapidly from 116 to 171 millions of

miles and its brightness falls off from 14 per cent of its brightness when at its near approach to the Earth in November, 1911, to only 6 per cent. Its "stellar brightness" at the end of April is 1.6; that is, it is rather nearer a second-magnitude than a first-magnitude star.

Jupiter on March 31st rises at about half-after one in the morning and on April 30th at about half-after nine in the evening. It is in *Scorpio* and moves eastward about 2° during March. In April it moves about the same amount westward.

Saturn is in the western sky in the evening, setting at about 11 P. M. on March 1st and about 7:30 on April 30th. During the two months it moves about 7° eastward and 2° northward from *Aries* into *Taurus*.

Uranus is a morning object, rising at about 5 A. M. on March 1st and at about 1 A. M. on April 30th. It is in *Capricorn* and moves about 2° eastward during the two months.

Neptune is above the horizon throughout most of the night on March 1st, not setting until about 4 A. M. On April 30th it sets at about midnight. It is in *Gemini* south of *Castor* and *Pollux*.

PLANETARY PHENOMENA FOR MAY AND JUNE, 1912.

BY MALCOLM McNEILL.

PHASES OF THE MOON, PACIFIC TIME.

Last Quarter .. May 9, 1 ^h 56 ^m A.M.	Last Quarter.. June 7, 6 ^h 36 ^m P.M.
New Moon ... " 16, 2 14 P.M.	New Moon ... " 14, 10 24 P.M.
First Quarter.. " 23, 6 11 A.M.	First Quarter.. " 21, 12 39 P.M.
Full Moon ... " 30, 3 30 P.M.	Full Moon ... " 29, 5 34 A.M.

The first magnitude star *Antares*, a *Scorpii*, will again be occulted by the Moon on the evening of June 26th. For the eastern part of the United States the occultation will begin not far from 11 P. M. and will last an hour or more. It will take place earlier for observers farther west.

The Sun reaches the summer solstice, its farthest distance north of the equator, on June 21st, 11 A. M. Pacific time.